

5 AMP

(TO-3)	(TO-66)
2N3021	SDT3706
2N3022	SDT3707
2N3023	SDT3708
2N3024	SDT3709
2N3025	SDT3710
2N3026	SDT3711

PNP INDUSTRIAL TRANSISTORS

ABSOLUTE MAXIMUM RATINGS

	2N3021 2N3024	2N3022 2N3025	2N3023 2N3026
BV_{CBO}	-30 V	-45 V	-60 V
BV_{CEO}	-30 V	-45 V	-60 V
BV_{EBO}	-4 V	-4 V	-4 V
I_C (Max.)	-3 A	-3 A	-3 A
I_B (Max.)	-0.5 A	-0.5 A	-0.5 A
P_T (25°C Case)	25 W	25 W	25 W
Operating Junction Temperature	200°C		
Storage Temperature Range	-65°C to +200°C		

ELECTRICAL CHARACTERISTICS (25°C Ambient)

Static

SYMBOL	CONDITIONS	MIN.	MAX.	UNITS	TYPE
I_{CEX}	$V_{CE} = 25 \text{ V}, V_{BE} = 2 \text{ V}$	-	-0.2	mA	2N3021, 2N3024
	$V_{CE} = 40 \text{ V}, V_{BE} = 2 \text{ V}$	-	-0.2	mA	2N3022, 2N3025
	$V_{CE} = 54 \text{ V}, V_{BE} = 2 \text{ V}$	-	-0.2	mA	2N3023, 2N3026
I_{CEX}	$V_{CE} = 15 \text{ V}, V_{BE} = 2 \text{ V}, T_c = 150^\circ\text{C}$	-	-2.0	mA	2N3021, 2N3024
	$V_{CE} = 25 \text{ V}, V_{BE} = 2 \text{ V}, T_c = 150^\circ\text{C}$	-	-2.0	mA	2N3022, 2N3025
	$V_{CE} = 35 \text{ V}, V_{BE} = 2 \text{ V}, T_c = 150^\circ\text{C}$	-	-2.0	mA	2N3023, 2N3026
I_{EBO}	$V_{EB} = -4 \text{ V}$	-	-1.0	mA	All
V_{CEO} (sus)	$I_B = 0, I_C = -100 \text{ mA}$	-30	-	Volts	2N3021, 2N3024
	$I_B = 0, I_C = -50 \text{ mA}$	-45	-	Volts	2N3022, 2N3025
	$I_B = 0, I_C = -20 \text{ mA}$	-60	-	Volts	2N3023, 2N3026
h_{FE}	$I_C = -1.0 \text{ A}, V_{CE} = -2 \text{ V}$	20	60	-	2N3021, 2N3022, 2N3023
	$I_C = -1.0 \text{ A}, V_{CE} = -2 \text{ V}$	50	180	-	2N3024, 2N3025, 2N3026
V_{CE} (sat)	$I_C = -3 \text{ A}, I_B = -0.3 \text{ A}$	-	-1.5	Volts	2N3021, 2N3022, 2N3023
	$I_C = -3 \text{ A}, I_B = -0.3 \text{ A}$	-	-1.0	Volts	2N3024, 2N3025, 2N3026
V_{BE} (sat)	$I_C = -3 \text{ A}, I_B = -0.3 \text{ A}$	-	-1.5	Volts	All

Dynamic

h_{fe}	$V_{CE} = -15 \text{ V}, I_C = -0.5 \text{ A}, f = 30 \text{ MHz}$	2.0	-	-	All
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ADDITIONAL DEVICES

ABSOLUTE MAXIMUM RATINGS

	SDT3706 SDT3709	SDT3707 SDT3710	SDT3708 SDT3711
BV_{CBO}	-30 V	-45 V	-60 V
BV_{CEO}	-30 V	-45 V	-60 V
BV_{EBO}	-4 V	-4 V	-4 V
I_C (Max.)	-5 A	-5 A	-5 A
I_B (Max.)	-1 A	-1 A	-1 A
P_T (100°C Case)	16 W	16 W	16 W
Operating Junction Temperature		200°C	
Storage Temperature Range		-65°C to +200°C	

ELECTRICAL CHARACTERISTICS (25°C Ambient)

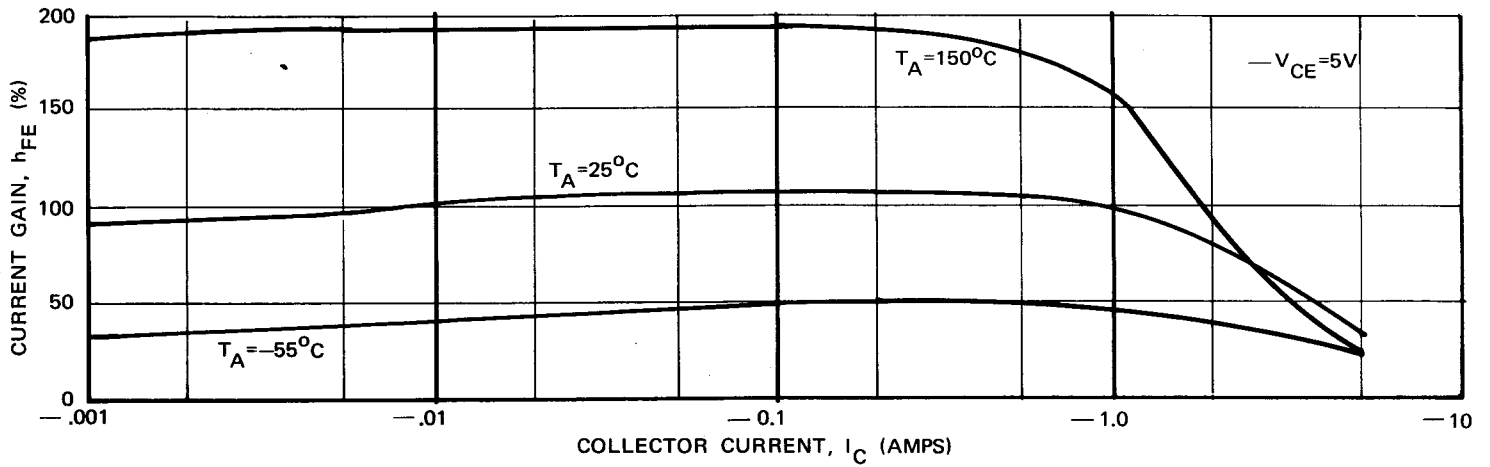
tatic

SYMBOL	CONDITIONS	MIN.	TYP.	MAX.	UNITS	TYPE
I_{CEX}	$V_{CE} = 25 \text{ V}, V_{BE} = 2 \text{ V}$	-	-	-0.2	mA	SDT3706, SDT3709
	$V_{CE} = 40 \text{ V}, V_{BE} = 2 \text{ V}$	-	-	-0.2	mA	SDT3707, SDT3710
	$V_{CE} = 54 \text{ V}, V_{BE} = 2 \text{ V}$	-	-	-0.2	mA	SDT3708, SDT3711
I_{CEX}	$V_{CE} = 15 \text{ V}, V_{BE} = 2 \text{ V}, T_c = 150^\circ\text{C}$	-	-	-2.0	mA	SDT3706, SDT3709
	$V_{CE} = 25 \text{ V}, V_{BE} = 2 \text{ V}, T_c = 150^\circ\text{C}$	-	-	-2.0	mA	SDT3707, SDT3710
	$V_{CE} = 35 \text{ V}, V_{BE} = 2 \text{ V}, T_c = 150^\circ\text{C}$	-	-	-2.0	mA	SDT3708, SDT3711
I_{EBO}	$V_{EB} = -4 \text{ V}$	-	-	-1.0	mA	All
$V_{CEO} \text{ (sus)}$	$I_B = 0, I_C = -100 \text{ mA}$	-30	-	-	Volts	SDT3706, SDT3709
	$I_B = 0, I_C = -50 \text{ mA}$	-45	-	-	Volts	SDT3707, SDT3710
	$I_B = 0, I_C = -20 \text{ mA}$	-60	-	-	Volts	SDT3708, SDT3711
h_{FE}	$I_C = -1.0 \text{ A}, V_{CE} = -2 \text{ V}$	20	-	60	-	SDT3706, SDT3707 SDT3708
	$I_C = -1.0 \text{ A}, V_{CE} = -2 \text{ V}$	50	-	180	-	SDT3709, SDT3710 SDT3711
$V_{CE} \text{ (sat)}$	$I_C = -3 \text{ A}, I_B = -0.3 \text{ A}$	-	-	-1.0	Volts	All
$V_{BE} \text{ (sat)}$	$I_C = -3 \text{ A}, I_B = -0.3 \text{ A}$	-	-	-1.4	Volts	All

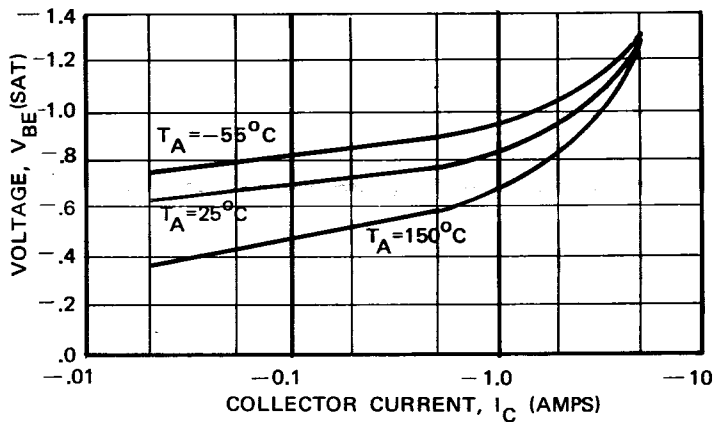
ynamic

t_d	(See Figure No. 1)	-	1	-	Nsec	All
t_r	(See Figure No. 1)	-	120	-	Nsec	All
t_s	(See Figure No. 1)	-	130	-	Nsec	All
t_f	(See Figure No. 1)	-	70	-	Nsec	All
h_{fe}	$V_{CE} = -15 \text{ V}, I_C = -0.5 \text{ A}, f = 30 \text{ MHz}$	-	2.0	-	-	All
C_{obo}	$V_{CB} = -10 \text{ V}, I_E = 0, f = 1 \text{ MHz}$	-	-	150	pf	All

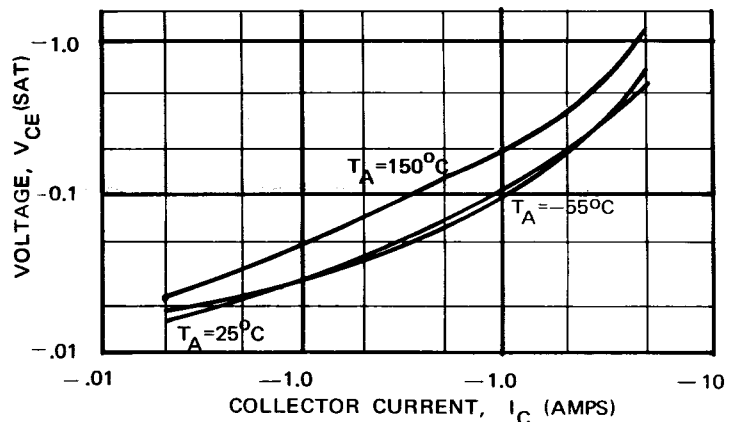
CHARACTERISTIC CURVES (ALL TYPES)



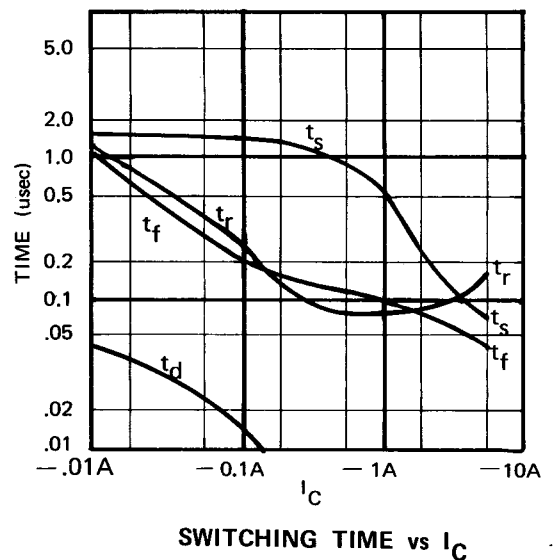
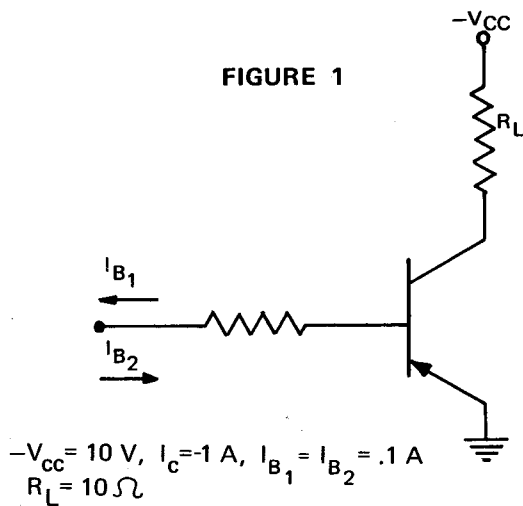
h_{FE} vs I_C

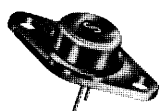
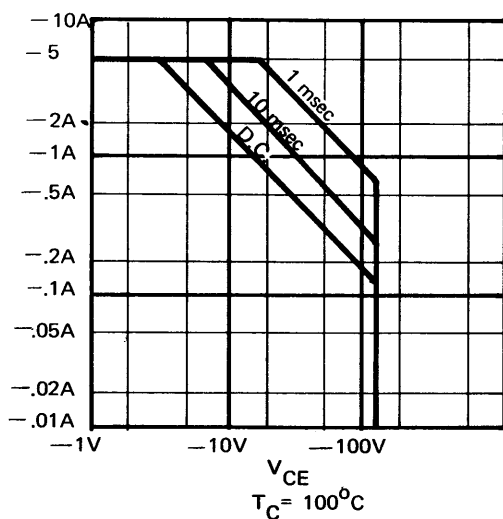


$V_{BE}(sat)$ vs I_C

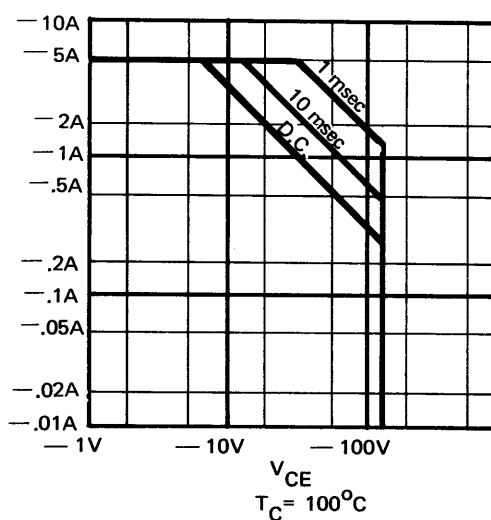


$V_{CE}(sat)$ vs I_C





TO-66



TO-3

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When you think of semiconductors... think Solitron!

20 AMP SILICON PLANAR NPN POWER TRANSISTORS

SPECIFICATIONS

2N3597
2N3598
2N3599

DESIGNED-IN ADVANTAGES

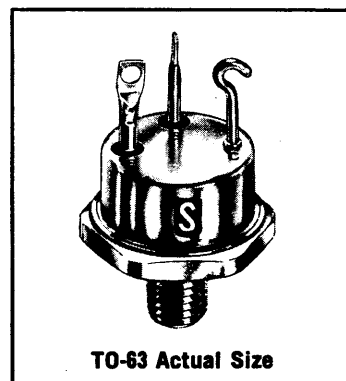
Greater Gain Linearity — planar fabrication techniques result in unusually constant gain over a wide current range. Gain is essentially flat from below 50 milliamps to over 10 ampere.

Low Saturation Voltage — $V_{CE(sat)}$ is less than 0.5V at $I_C = I_0A$ for lower losses in the saturated mode.

Fast Switching — shorter rise, fall, and storage time make these transistors ideal for switching applications that demand high speed at high currents.

High Frequency Response — a minimum gain cutoff frequency of 30 mc makes these transistors desirable for high power, high frequency switching and amplifier applications.

Low Leakage — I_{CBO} is less than 100 nanoamps at $V_{CB} = 60V$ for exceptional circuit stability.



ABSOLUTE MAXIMUM RATINGS

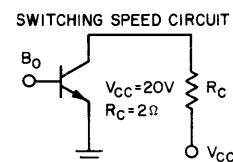
Collector-to-Base Voltage		
2N3597	60 Vdc max.	
2N3598	80 Vdc max.	
2N3599	100 Vdc max.	
Collector-to-Emitter Voltage		
2N3597	40 Vdc max.	
2N3598	60 Vdc max.	
2N3599	80 Vdc max.	
Emitter-to-Base Voltage	8 Vdc max.	
Collector Current	20 Adc max.	
Base Current	5 Adc max.	
Thermal Resistance, Junction to Case	1 °C/W	
Total Dissipation at I_C (max.) ⁽¹⁾		
100°C Case Temperature	100 W max.	
Operating Junction Temperature	200 °C max.	
Storage Temperature Range	-65 to +200°C	

NOTE: (1) See safe operating area curves for derating.

Soliton DEVICES, INC. / TRANSISTOR DIVISION

ELECTRICAL CHARACTERISTICS @ 25°C ambient unless otherwise noted.

Symbol	Min.	Max.	Unit	Conditions
$h_{FE}^{(1)}$	40 20 10 75	120 225		$I_C = 10A, V_{CE} = 2V$ $I_C = 10A, V_{CE} = 2V$ $T_C = -55^\circ C$ $I_C = 20A, V_{CE} = 5V$ $I_C = 50mA, V_{CE} = 2V$
$V_{CE(sat)}^{(1)}$		0.5 1.5	Vdc Vdc	$I_C = 10A, I_B = 1A$ $I_C = 20A, I_B = 2A$
$V_{BE}^{(1)}$		1.2	Vdc	$I_C = 10A, V_{CE} = 2V$
$V_{BE(sat)}^{(1)}$		1.5 2.0	Vdc Vdc	$I_C = 10A, I_B = 1A$ $I_C = 20A, I_B = 2A$
BV_{CBO}	60 80 100		Vdc Vdc Vdc	$I_C = 100\mu A, I_E = 0$ 2N3597 2N3598 2N3599
BV_{CEO}	40 60 80		Vdc Vdc Vdc	$I_C \leq 10mA, I_B = 0$ 2N3597 2N3598 2N3599
BV_{EBO}	8		Vdc	$I_E = 100\mu A, I_C = 0$
$V_{CEO(sust)}^{(1)}$ (Collector-to-Emitter Sustain Voltage)	30 50 70		Vdc Vdc Vdc	$I_C = 100mA, I_B = 0$ 2N3597 2N3598 2N3599
I_{CEX} (Collector Cutoff Current, Reverse Bias)		10 10 10 100	μA μA μA μA	$V_{EB} = 0.5V$ 2N3597@ $V_{CE} = 60V$ 2N3598@ $V_{CE} = 80V$ 2N3599@ $V_{CE} = 100V$ $V_{EB} = 0.5V, V_{CE} = 60V$ $T = 150^\circ C$ (all types)
I_{CBO}		0.1	μA	$V_{CB} = 60V, I_E = 0$
I_{EBO}		0.1	μA	$V_{EB} = 5V, I_C = 0$
I_{CEO}		1.0 1.0 1.0 1.0	μA μA mA mA	$I_B = 0$ 2N3597@ $V_{CE} = 30V$ 2N3598, 99 @ $V_{CE} = 50V$ 2N3597@ $V_{CE} = 30V, T_C = 150^\circ C$ 2N3598, 99 @ $V_{CE} = 50V, T_C = 150^\circ C$
$ h_{fe} $ (High Frequency Small Signal)	3			$V_{CE} = 10V, I_C = 1A, f = 10mc$
h_{fe} (Small Signal)	75	250		$V_{CE} = 5V, I_C = 50mA, f = 1kc$
C_{ob}		700	pf	$V_{CB} = 10V,$ $I_E = 0,$ $f = 1mc$
$t_{ON}^{(2)}$ (Turn On Time)		700	nsec	$I_C = 10A,$ $I_{B1} = 1A, I_{B0} = 0$
$t_{OFF}^{(2)}$ (Turn Off Time)		2700	nsec	$I_C = 10A,$ $I_{B1} = I_{B2} = 1A$



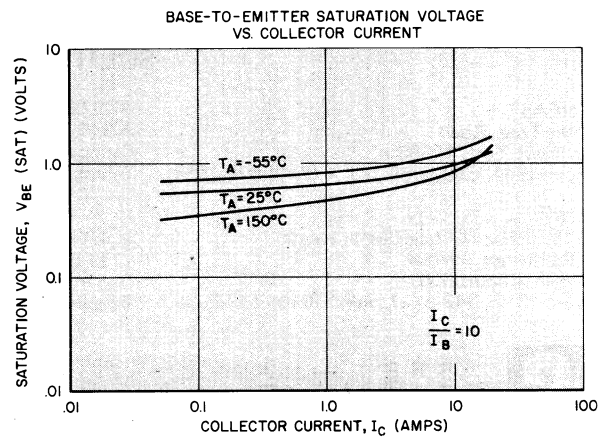
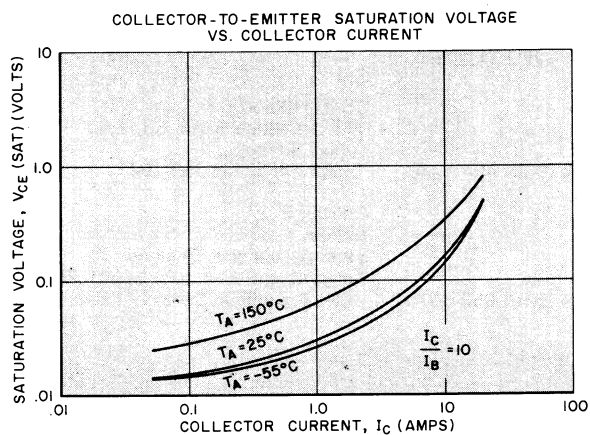
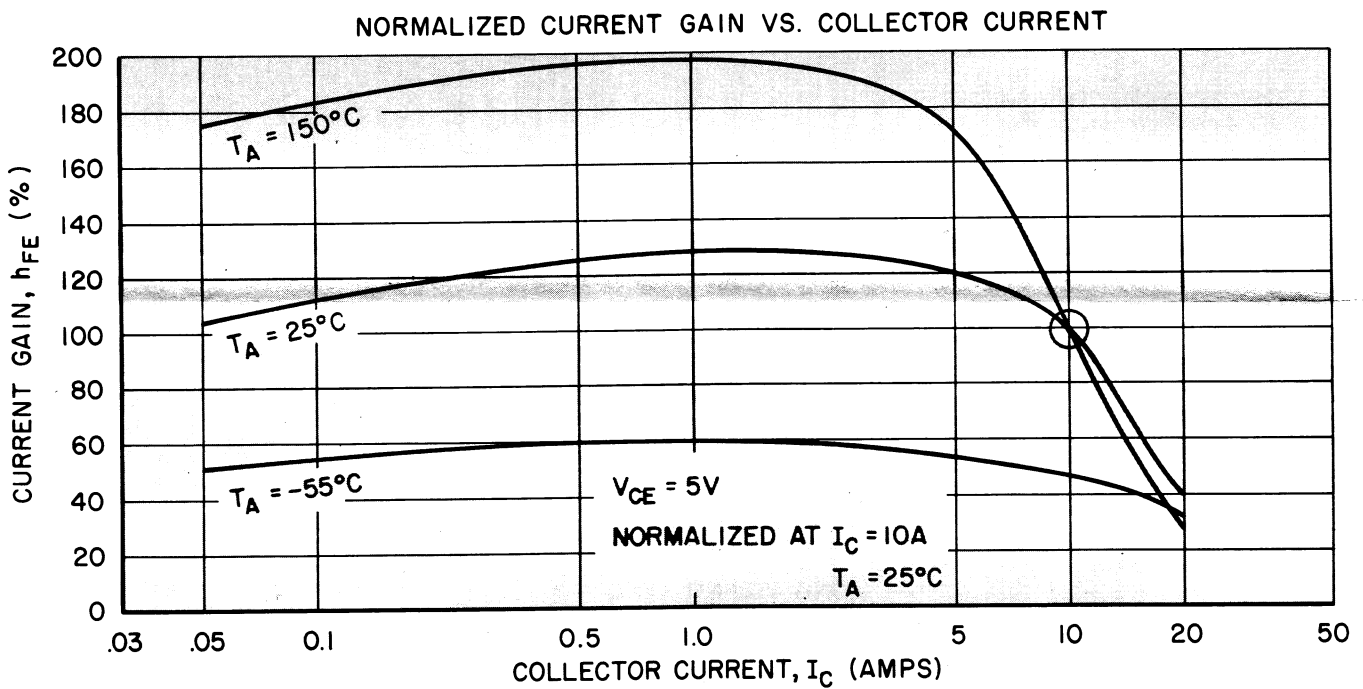
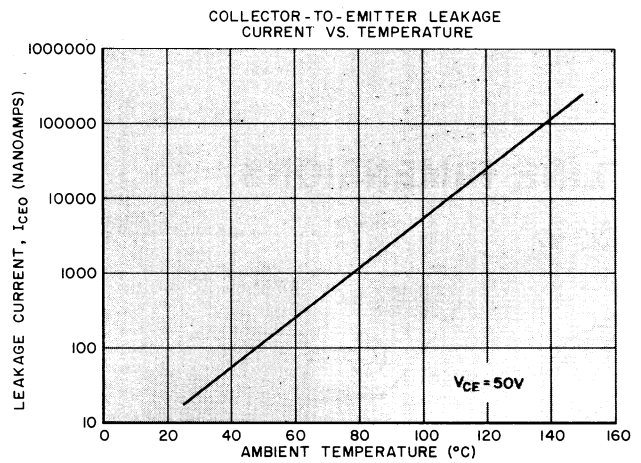
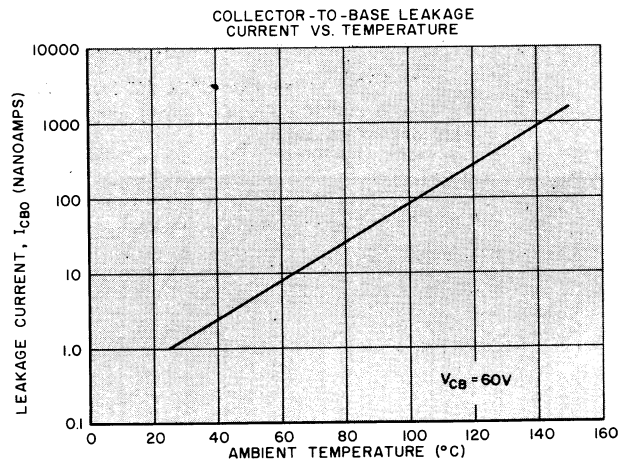
NOTES:

1. Pulse measurement conditions: length $\leq 330 \mu sec$; duty cycle $\leq 2\%$.

2. All switching circuit resistances are $\pm 1\%$. Pulse rate = 500 PPS. Pulse width = 10 μsec . The pulse must be

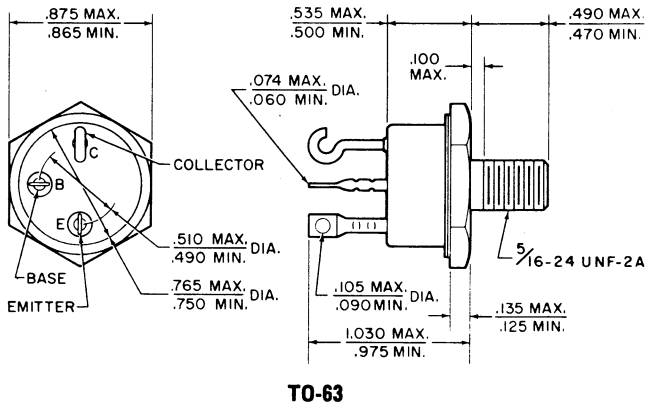
wide enough to prevent any change from affecting storage time. Reference MIL-STD-750, method 3251, test condition A.

TYPICAL CHARACTERISTICS

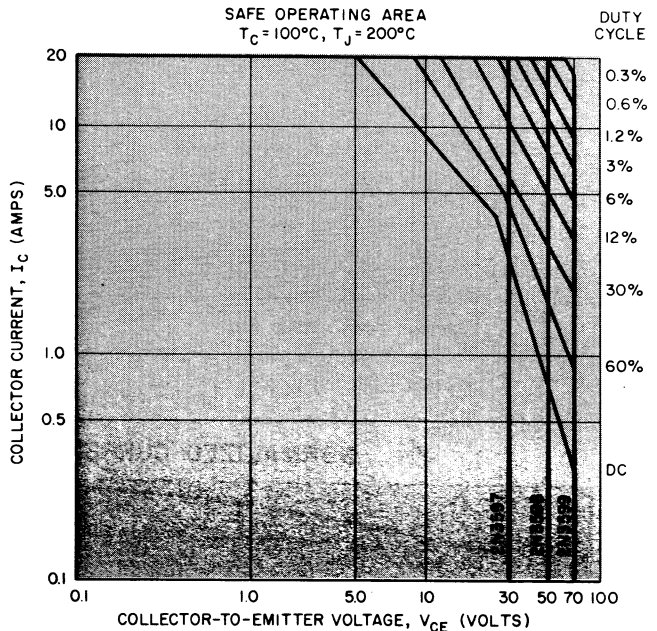


TYPICAL CHARACTERISTICS, continued

OUTLINE DIMENSIONS



- NOTES:** 1. Collector is electrically common to case.
2. All dimensions in inches.



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2 AMP

PNP INDUSTRIAL TRANSISTORS

ABSOLUTE MAXIMUM RATINGS

	2N3660	2N3661
BV_{CBO}	- 40 V	-60 V
BV_{CEO}	- 30 V	-50 V
BV_{EBO}	- 5 V	- 5 V
I_C (Max.)	-1.5 A	-1.5 A
I_B (Max.)	- 0.5 A	- 0.5 A
P_T (100°C Case)	5 W	5 W
Operating Junction Temperature	200°C	
Storage Temperature Range	-65°C to +200°C	

ELECTRICAL CHARACTERISTICS (25°C Ambient)

Static						
SYMBOL	CONDITIONS	MIN.	MAX.	UNITS	TYPE	
I_{CBO}	$V_{CB} = -20\text{ V}$	—	—100	NA	2N3660	
	$V_{CB} = -30\text{ V}$	—	—100	NA	2N3661	
	$V_{CB} = -20\text{ V}, T = 150^{\circ}\text{C}$	—	—100	μA	2N3660	
	$V_{CB} = -30\text{ V}, T = 150^{\circ}\text{C}$	—	—100	μA	2N3661	
I_{EBO}	$V_{EB} = -5\text{ V}$	—	—10	μA	Both	
BV_{CBO}	$I_C = -10\text{ }\mu\text{A}, I_E = 0$	—40	—	Volts	2N3660	
	$I_C = -10\text{ }\mu\text{A}, I_E = 0$	—60	—	Volts	2N3661	
BV_{CEO}	$I_C = -50\text{ mA}, I_B = 0$	—30	—	Volts	2N3660	
	$I_C = -50\text{ mA}, I_B = 0$	—50	—	Volts	2N3661	
h_{FE}	$V_{CE} = -10\text{ V}, I_C = -500\text{ mA}$	25	100	—	Both	
	$V_{CE} = -10\text{ V}, I_C = -1.5\text{ A}$	15	—	—	Both	
	$V_{CE} = -10\text{ V}, I_C = -50\text{ mA}$	15	—	—	Both	
$V_{CE}(\text{sat})$	$I_C = -500\text{ mA}, I_B = -50\text{ mA}$	—	—1.2	Volts	Both	
$V_{BE}(\text{sat})$	$I_C = -500\text{ mA}, I_B = -50\text{ mA}$	—	—1.8	Volts	Both	
Dynamic						
h_{fe}	$V_{CE} = -15\text{ V}, I_C = -50\text{ mA}, f = 20\text{ MHz}$	1.25	—	—	Both	
C_{obo}	$V_{CB} = -10\text{ V}, I_E = 0, f = 1\text{ MHz}$	—	275	pf	Both	

ADDITIONAL DEVICES

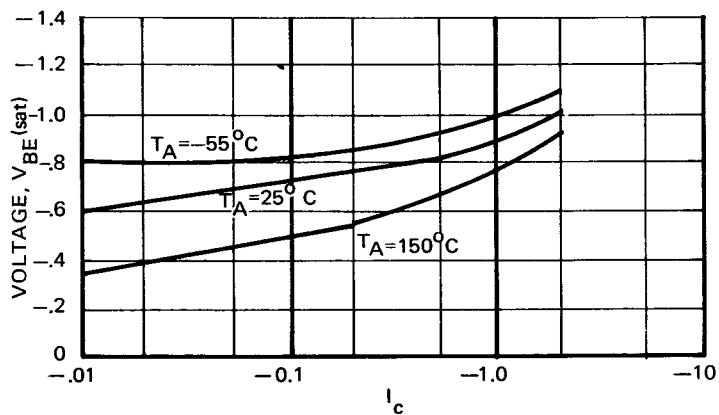
ABSOLUTE MAXIMUM RATINGS

	SDT3578	SDT3579
BV_{CBO}	-40 V	-60 V
BV_{CEO}	-30 V	-50 V
BV_{EBO}	-5 V	-5 V
I_C (Max.)	-2 A	-2 A
I_B (Max.)	-1 A	-1 A
P_T (100°C Case)	10 W	10 W
Operating Junction Temperature	200°C	
Storage Temperature Range	-65°C to +200°C	

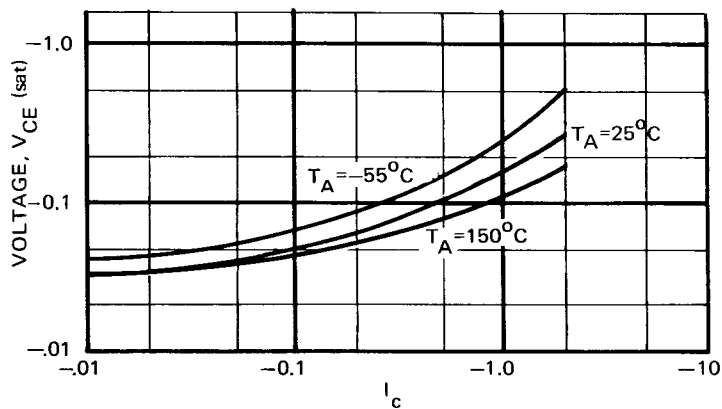
ELECTRICAL CHARACTERISTICS (25°C Ambient)

Static						
SYMBOL	CONDITIONS	MIN.	TYP.	MAX.	UNITS	TYPE
I_{CBO}	$V_{CB} = -20$ V	—	—	-100	nA	SDT3578
	$V_{CB} = -30$ V	—	—	-100	nA	SDT3579
	$V_{CB} = -20$ V, $T = 150^\circ\text{C}$	—	—	-100	μA	SDT3578
	$V_{CB} = -30$ V, $T = 150^\circ\text{C}$	—	—	-100	μA	SDT3579
I_{EBO}	$V_{EB} = -5$ V	—	—	-10	μA	Both
BV_{CBO}	$I_C = -10 \mu\text{A}$, $I_E = 0$	-40	—	—	Volts	SDT3578
	$I_C = -10 \mu\text{A}$, $I_E = 0$	-60	—	—	Volts	SDT3579
BV_{CEO}	$I_C = -50$ mA, $I_B = 0$	-30	—	—	Volts	SDT3578
	$I_C = -50$ mA, $I_B = 0$	-50	—	—	Volts	SDT3579
h_{FE}	$V_{CE} = -10$ V, $I_C = -0.5$ A	25	—	100	—	Both
	$V_{CE} = -10$ V, $I_C = -1.5$ A	15	—	—	—	Both
$V_{CE}(\text{sat})$	$I_C = -0.5$ A, $I_B = -0.05$ A	—	—	-0.5	Volts	Both
$V_{BE}(\text{sat})$	$I_C = -0.5$ A, $I_B = -0.05$ A	—	—	-0.9	Volts	Both
Dynamic						
t_d	(see Figure No. 1)	—	10	—	Nsec	Both
t_r	(see Figure No. 1)	—	150	—	Nsec	Both
t_s	(see Figure No. 1)	—	500	—	Nsec	Both
t_f	(see Figure No. 1)	—	200	—	Nsec	Both
h_{fe}	$V_{CE} = -15$ V, $I_C = -50$ mA, $f = 20$ MHz	2.0	—	—	—	Both
C_{obo}	$V_{CB} = -10$ V, $I_E = 0$, $f = 1$ MHz	—	—	100	pf	Both

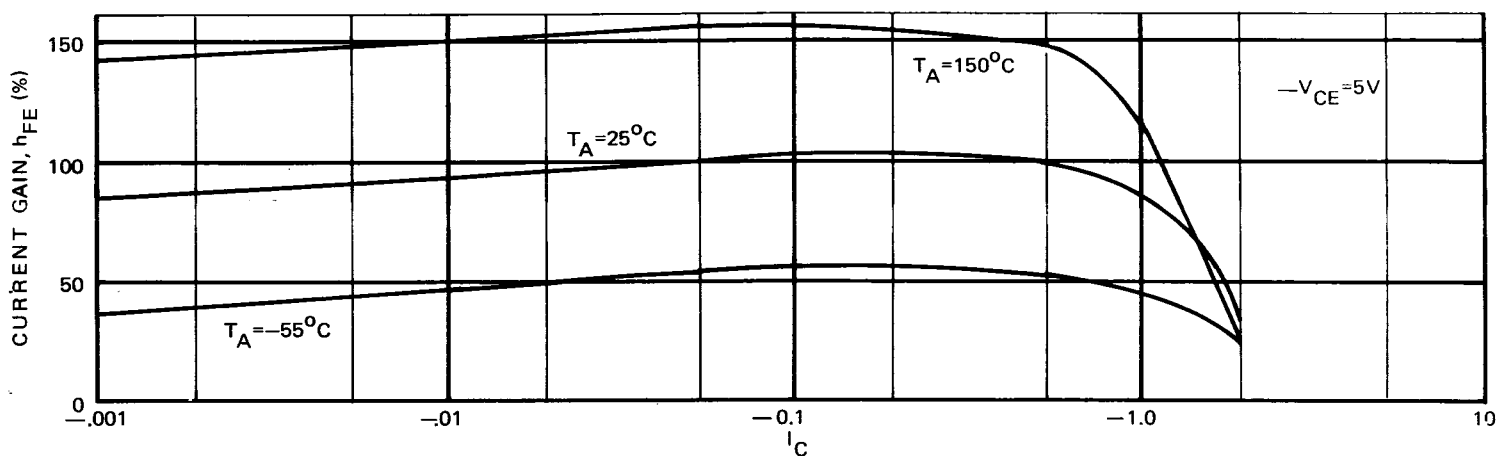
CHARACTERISTIC CURVES (ALL TYPES)



$V_{BE(sat)}$ vs I_C

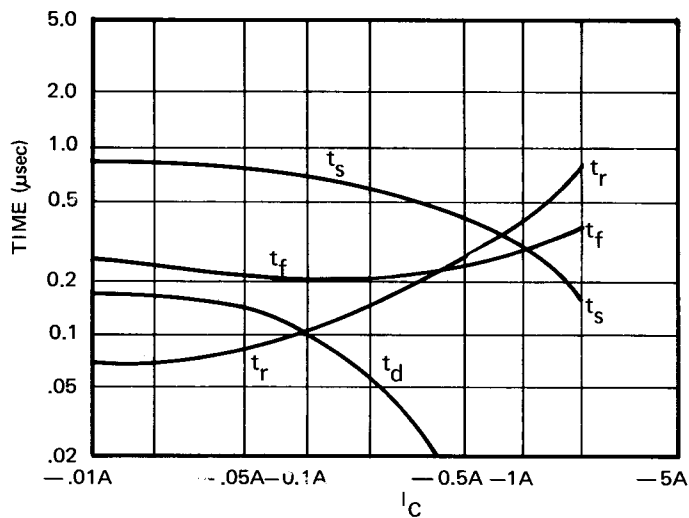
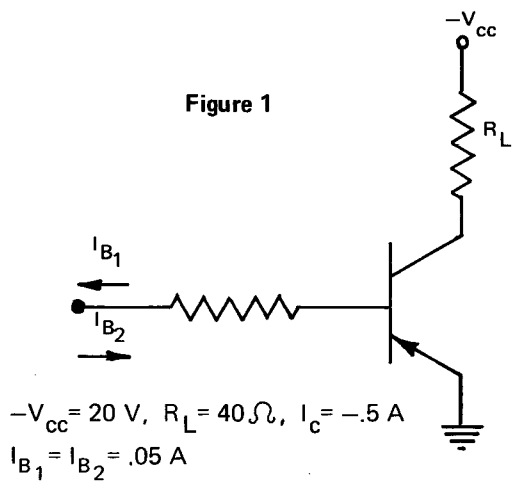


$V_{CE(sat)}$ vs I_C

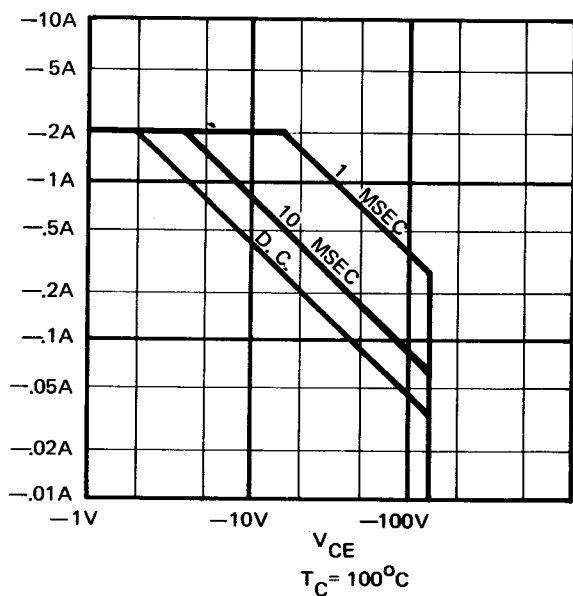


h_{FE} vs I_C

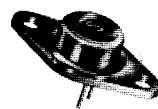
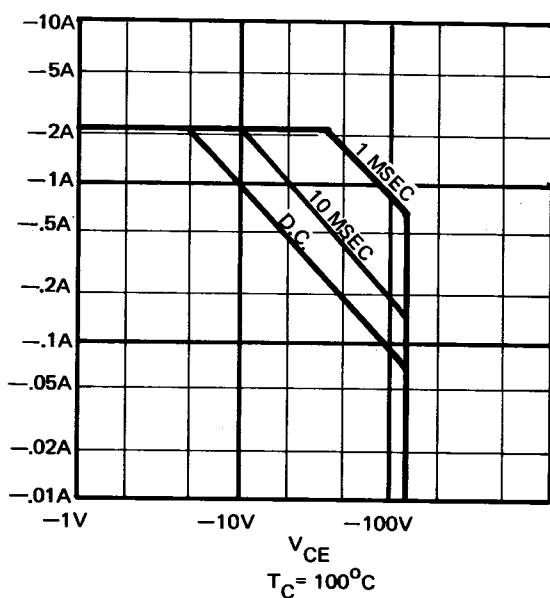
Figure 1



SWITCHING TIME vs I_C



TO-5



TO-66

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5 AMP SILICON PLANAR NPN POWER TRANSISTORS

S P E C I F I C A T I O N S

2N3747
2N3748
2N3749

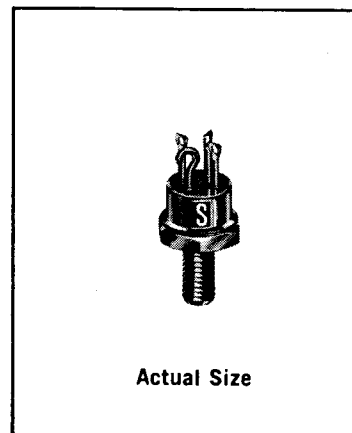
DESIGNED-IN ADVANTAGES

Isolated Collector Package — beryllium oxide wafer electrically isolates the transistor chip from the case, eliminating the need for mica washers and insulating bushings. Design freedom without power derating, simplified production assembly, and increased reliability are all gained by using the isolated-collector package.

Greater Gain Stability — planar fabrication techniques give these new Solitron transistors unusually consistent gain, even across a wide range of currents. Gain is flat from below 50 milliamps to above 1 amp.

Fast Switching — shorter rise, fall, and storage times make these transistors ideal for switching applications that demand high speed at high currents.

High Frequency Response — a minimum gain cutoff frequency of 40 mc makes these transistors desirable for high power, high frequency switching and amplifier application.



ABSOLUTE MAXIMUM RATINGS

Collector-to-Base Voltage

2N3747	60 Vdc max.
2N3748	80 Vdc max.
2N3749	100 Vdc max.

Collector-to-Emitter Voltage

2N3747	40 Vdc max.
2N3748	60 Vdc max.
2N3749	80 Vdc max.

Emitter-to-Base Voltage

2N3747	7 Vdc max.
2N3748, 2N3749	8 Vdc max.

Collector Current 5 Adc max.

Base Current 0.5 Adc max.

Thermal Resistance, Junction to Case 3.33 °C/W

Total Dissipation at I_C (max.)⁽¹⁾

100°C Case Temperature 30 W max.

Operating Junction Temperature 200 °C max.

Storage Temperature Range -65 to +200°C

NOTE.

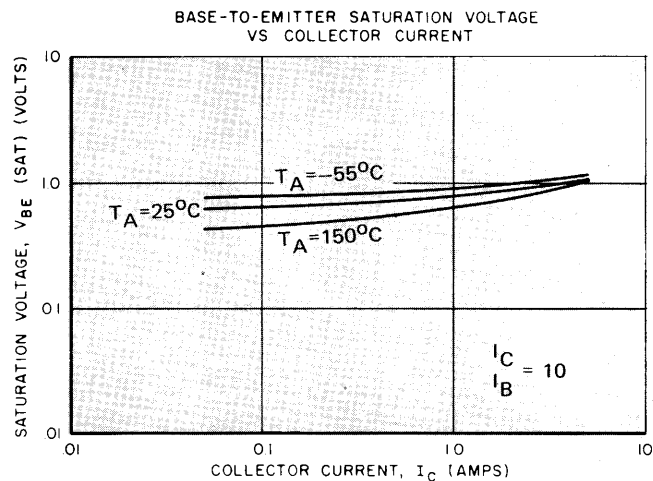
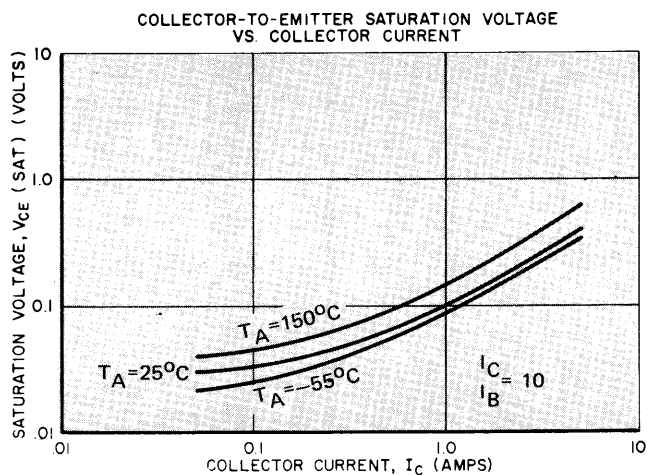
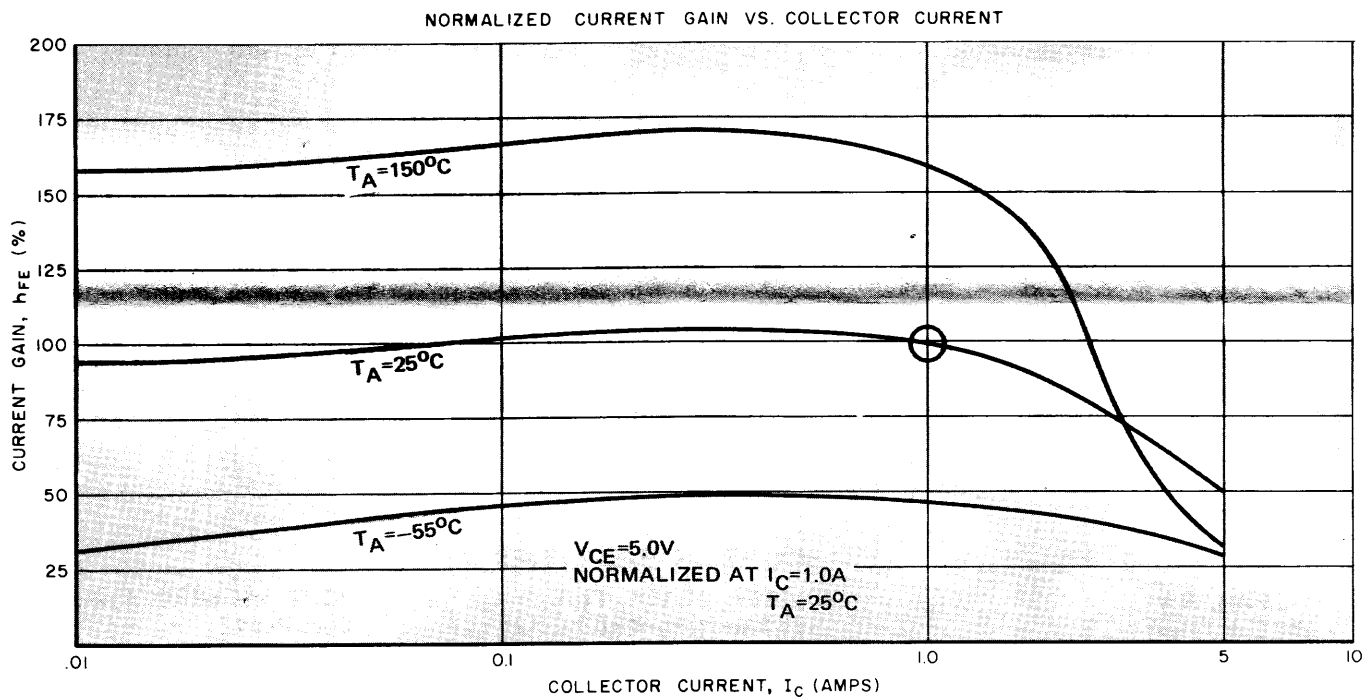
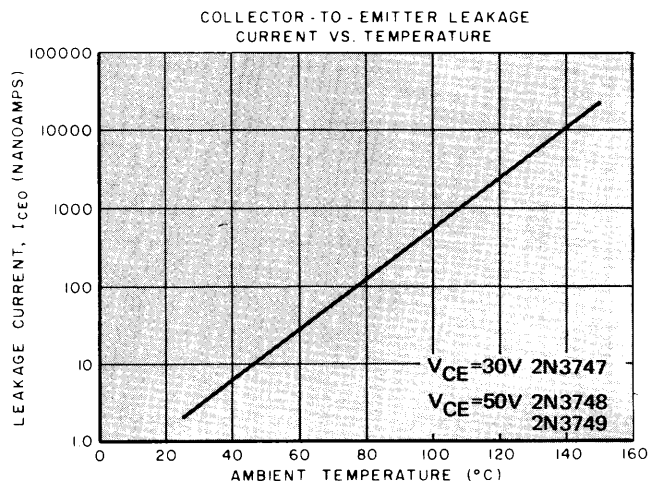
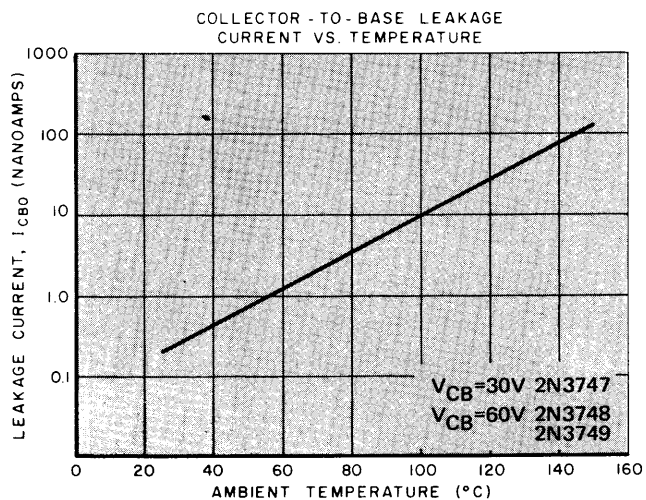
1. See safe operating area curves for derating.

ELECTRICAL CHARACTERISTICS @ 25°C ambient unless otherwise noted.

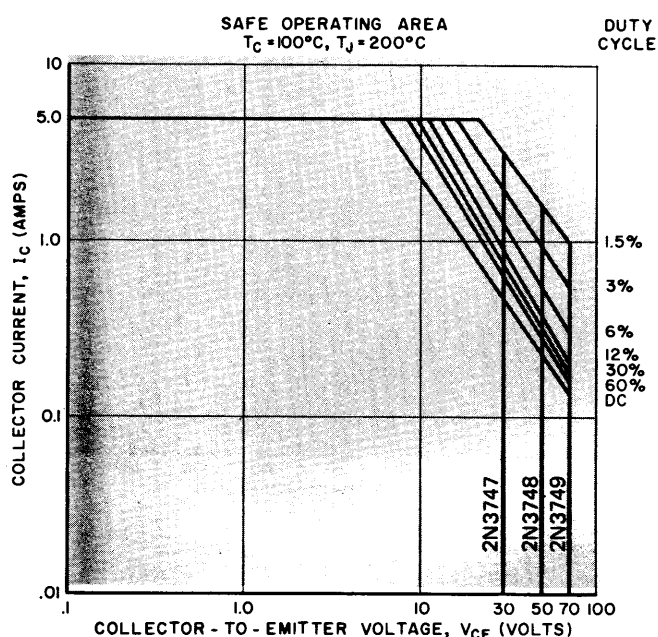
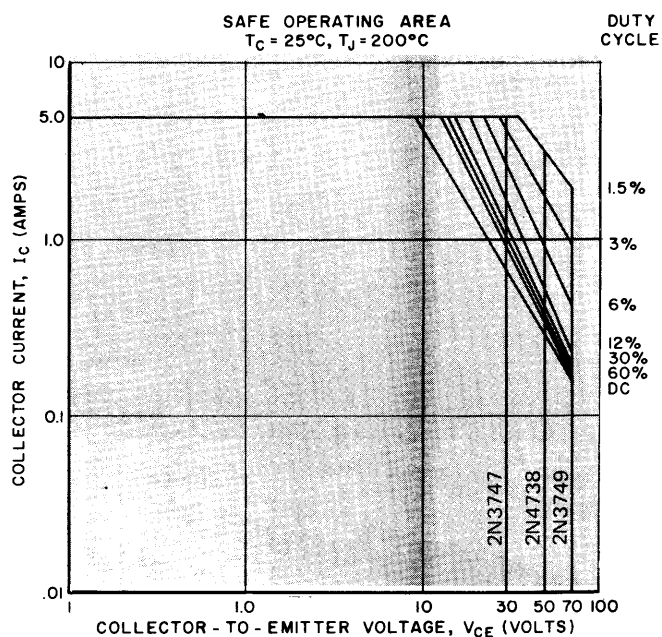
SYMBOL	MIN.	MAX.	UNIT	CONDITIONS
$h_{FE}^{(1)}$	40 15 15 30	120		$I_C = 1A, V_{CE} = 5V$ $I_C = 1A, V_{CE} = 2V, T_C = -55^\circ C$ $I_C = 5A, V_{CE} = 5V$ $I_C = 10mA, V_{CE} = 2V$
$V_{CE(sat)}^{(1)}$		0.25 2.0	Vdc Vdc	$I_C = 1A, I_B = 0.1A$ $I_C = 5A, I_B = 0.5A$
$V_{BE}^{(1)}$		1.2	Vdc	$I_C = 1A, V_{CE} = 5V$
$V_{BE(sat)}^{(1)}$		1.2	Vdc	$I_C = 1A, I_B = 0.1A$
BV_{CBO}	60 80 100		Vdc Vdc Vdc	$I_C = 10\mu A, I_E = 0$ 2N3747 2N3748 2N3749
BV_{CEO}	40 60 80		Vdc Vdc Vdc	$I_C = 10mA, I_B = 0$ 2N3747 2N3748 2N3749
BV_{EBO}	7 8		Vdc Vdc	$I_E = 10\mu A, I_C = 0$ 2N3747 2N3748, 2N3749
$V_{CEO(sust)}^{(1)}$ (Collector-to-Emitter Sustain Voltage)	30 50 70		Vdc Vdc Vdc	$I_C = 100mA, I_B = 0$ 2N3747 2N3748 2N3749
I_{CEX} (Collector Cutoff Current, Reverse Bias)		10 10 10 50 50	μA μA μA μA μA	$V_{EB} = 0.5V$ 2N3747 @ $V_{CE} = 60V$ 2N3748 @ $V_{CE} = 80V$ 2N3749 @ $V_{CE} = 100V$ 2N3747 @ $V_{CE} = 40V, T_C = 150^\circ C$ 2N3748, 2N3749 @ $V_{CE} = 60V,$ $T_C = 150^\circ C$
I_{CBO}		0.1 0.1	μA μA	$I_E = 0$ 2N3747 @ $V_{CB} = 30V$ 2N3748, 2N3749 @ $V_{CB} = 60V$
I_{EBO}		0.1	μA	$V_{EB} = 5V, I_C = 0$
I_{CEO}		100 100	μA μA	$I_B = 0$ 2N3747 @ $V_{CE} = 30V$ 2N3748, 2N3749 @ $V_{CE} = 50V$
h_{fe} (High Frequency Small Signal)	4			$V_{CE} = 10V, I_C = 1A, f = 10mc$
h_{fe} (Small Signal)	40	140		$V_{CE} = 5V, I_E = 50mA, f = 1kc$
C_{ob}		150	pf	$V_{CB} = 10V, I_E = 0, f = 1mc$
t_r (Pulse Rise Time)		80	nsec	
t_s (Pulse Storage Time)		60	nsec	
t_f (Pulse Fall Time)		80	nsec	

NOTE: 1. Pulse measurement: conditions: length $\leq 330\mu sec$; duty cycle 2%.

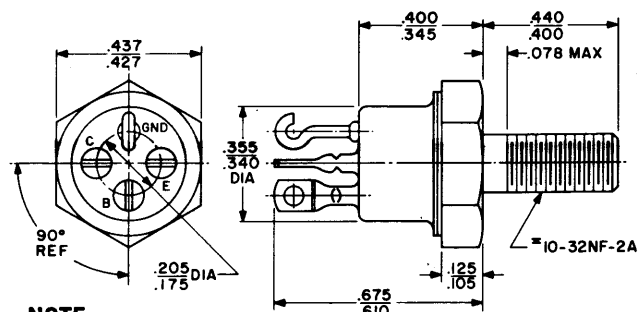
TYPICAL CHARACTERISTICS



TYPICAL CHARACTERISTICS, continued



OUTLINE DIMENSIONS



NOTE:

1. All dimensions in inches.

MOUNTING

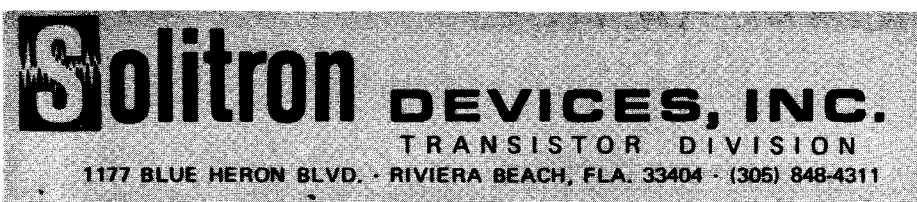
It is very important that a power transistor be provided with a good heat dissipating facility. The surface to which the transistor is attached must be flat and free from burrs. The nut must be tightened securely (16 in.-lb. minimum to 23 in.-lb. maximum torque limit when used against a metal chassis, provided that all parts are clean and dry).

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2N3774 2N3778
2N3775 2N3779
2N3776 2N3780
2N3777 2N3781
2N3782

2 AMP

PNP INDUSTRIAL TRANSISTORS

ABSOLUTE MAXIMUM RATINGS

	<u>2N3774</u>	<u>2N3775</u>	<u>2N3776</u>	<u>2N3777</u>
BV_{CBO}	-40 V	-60 V	-80 V	-100 V
BV_{CEO}	-40 V	-60 V	-80 V	-100 V
BV_{EBO}	-8 V	-8 V	-8 V	-8 V
I_C (Max.)	-1 A	-1 A	-1 A	-1 A
I_B (Max.)	-5 A	-5 A	-5 A	-5 A
P_T (100°C Case)	5 W	5 W	5 W	5 W
Operating Junction Temperature	200°C			
Storage Temperature Range	-65°C to +200°C			

ELECTRICAL CHARACTERISTICS (25°C Ambient)

Static

<u>SYMBOL</u>	<u>CONDITIONS</u>	<u>MIN.</u>	<u>MAX.</u>	<u>UNITS</u>	<u>TYPE</u>
I_{CEX}	$V_{CE} = \text{Rated } V_{CB}, V_{BE} = 1.5 \text{ V}$	-	-0.5	mA	All
	$V_{CE} = \text{Rated } V_{CB}, V_{BE} = 1.5 \text{ V}, T_C = 150^\circ\text{C}$	-	-5.0	mA	All
I_{EBO}	$V_{EB} = -8 \text{ V}$	-	-0.5	mA	All
BV_{CEO} (sus)	$I_B = 0, I_C = -50 \text{ mA}$	-40	-	Volts	2N3774
		-60	-	Volts	2N3775
		-80	-	Volts	2N3776
		-100	-	Volts	2N3777
h_{FE}	$I_C = -200 \text{ mA}, V_{CE} = -2 \text{ V}$	20	60	-	All
V_{CE} (sat)	$I_C = -200 \text{ mA}, I_B = -20 \text{ mA}$	-	-0.2	Volts	All
V_{BE} (sat)	$I_C = -200 \text{ mA}, I_B = -20 \text{ mA}$	-	-1.2	Volts	All

Dynamic

$T_{ON} (t_r + t_d)$	$I_C = -200 \text{ mA}, I_{B1} = -20 \text{ mA}$	-	3.0	μsec	All
$T_{OFF} (t_s + t_f)$	$I_C = -200 \text{ mA}, I_{B2} = 20 \text{ mA}$	-	3.0	μsec	All
h_{fe}	$V_{CE} = -10 \text{ V}, I_C = -50 \text{ mA}, f = 1 \text{ MHz}$	1.0	-	-	All

ADDITIONAL DEVICES

ABSOLUTE MAXIMUM RATINGS

	2N3778	2N3779	2N3780	2N3781	2N3782
BV_{CBO}	-40 V	-60 V	-80 V	-100 V	-40 V
BV_{CEO}	-40 V	-60 V	-80 V	-100 V	-40 V
BV_{EBO}	-8 V	-8 V	-8 V	-8 V	-8 V
I_C (Max.)	-1 A	-1 A	-1 A	-1 A	-3 A
I_B (Max.)	-0.5 A	-0.5 A	-0.5 A	-0.5 A	-1 A
P_T (100°C Case)	5 W	5 W	5 W	5 W	5 W
Operating Junction Temperature	200°C				
Storage Temperature Range	-65°C to +200°C				

ELECTRICAL CHARACTERISTICS (25°C Ambient)

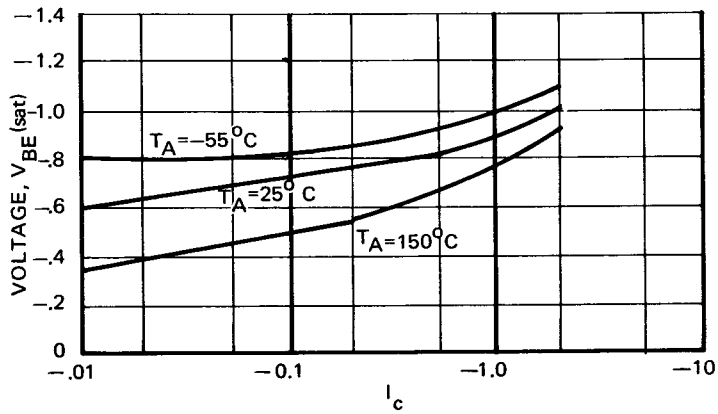
Static

SYMBOL	CONDITIONS	MIN.	MAX.	UNITS	TYPE
I_{CEX}	$V_{CE} = \text{Rated } V_{CB}, V_{BE} = 1.5 \text{ V}$	-	-0.5	mA	All
	$V_{CE} = \text{Rated } V_{CB}, V_{BE} = 1.5 \text{ V}, T_C = 150^\circ\text{C}$	-	-5.0	mA	All
I_{EBO}	$V_{EB} = -8 \text{ V}$	-	-0.5	mA	All
$BV_{CEO} \text{ (sus)}$	$I_B = 0, I_C = -50 \text{ mA}$	-40	-	Volts	2N3778, 2N3782
		-60	-	Volts	2N3779
		-80	-	Volts	2N3780
		-100	-	Volts	2N3781
h_{FE}	$I_C = -200 \text{ mA}, V_{CE} = -2 \text{ V}$	10	40	-	All
	$I_C = -1 \text{ A}, V_{CE} = -3 \text{ V}$	10	60	-	2N3782
$V_{CE} \text{ (sat)}$	$I_C = -200 \text{ mA}, I_B = -40 \text{ mA}$	-	-0.2	Volts	All
	$I_C = -1 \text{ A}, I_B = -200 \text{ mA}$	-	-0.75	Volts	All
$V_{BE} \text{ (sat)}$	$I_C = -200 \text{ mA}, I_B = -40 \text{ mA}$	-	-1.2	Volts	All
	$I_C = -1 \text{ A}, I_B = -200 \text{ mA}$	-	-1.75	Volts	All

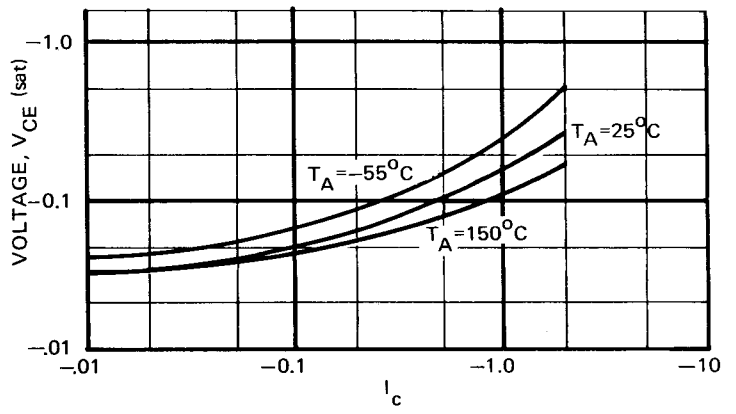
Dynamic

$T_{ON} (t_r + t_d)$	$I_C = -200 \text{ mA}, I_{B1} = -40 \text{ mA}$	-	3.0	μSec	All
	$I_C = -1 \text{ A}, I_{B2} = 200 \text{ mA}$	-	3.0	μSec	All
$T_{OFF} (t_s + t_f)$	$I_C = -200 \text{ mA}, I_{B2} = +40 \text{ mA}$	-	3.0	μSec	All
	$I_C = -1 \text{ A}, I_{B2} = 200 \text{ mA}$	-	3.0	μSec	All
h_{fe}	$V_{CE} = -10 \text{ V}, I_C = -50 \text{ mA}, f = 1 \text{ MHz}$	1.0	-	-	All

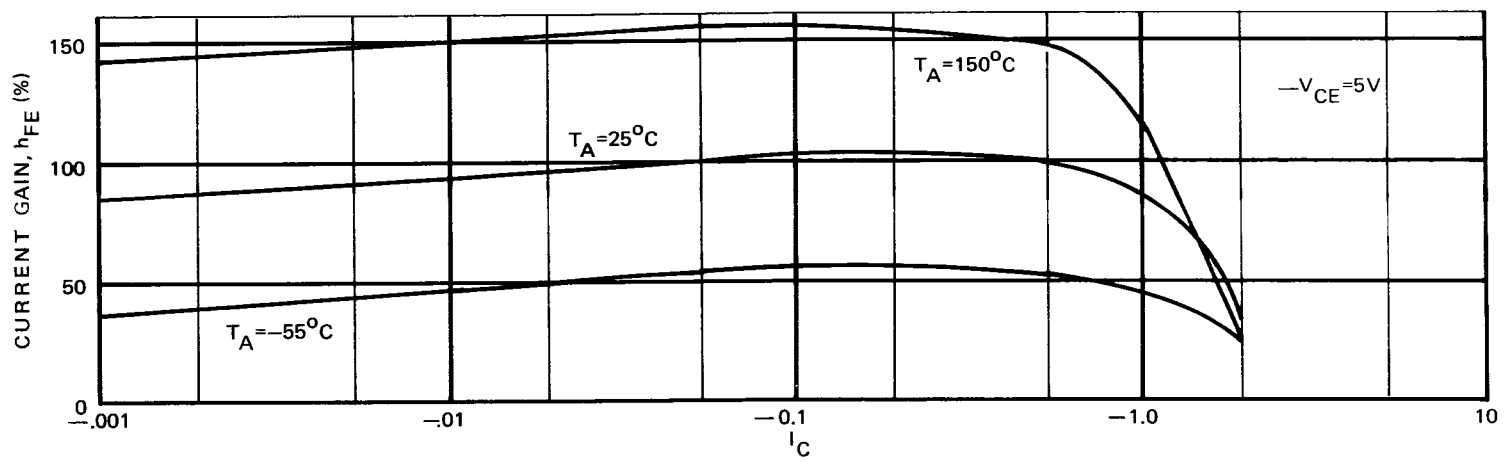
CHARACTERISTIC CURVES (ALL TYPES)



$V_{BE(sat)}$ vs I_C

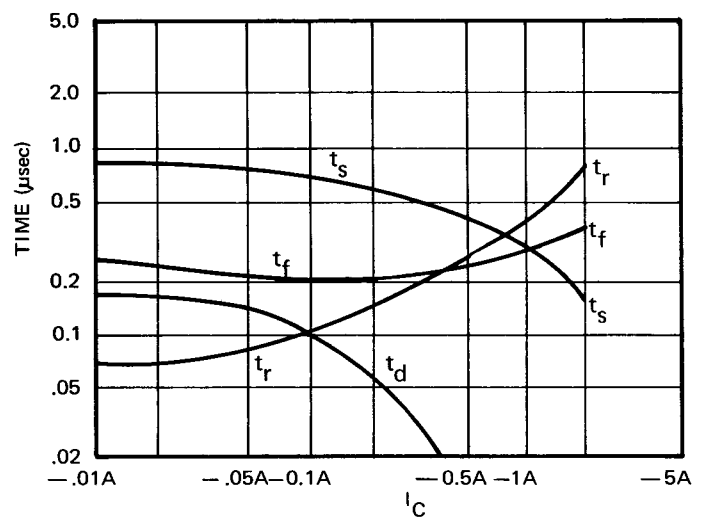
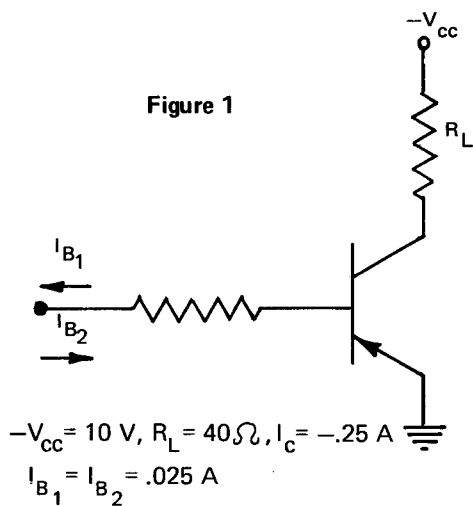


$V_{CE(sat)}$ vs I_C

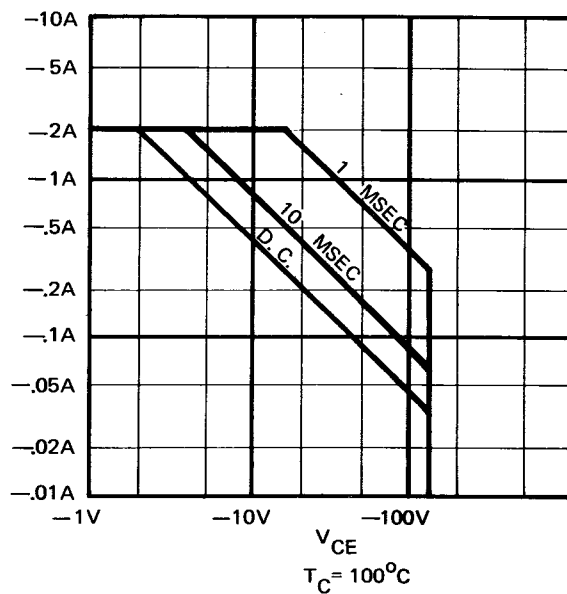


h_{FE} vs I_C

Figure 1



SWITCHING TIME vs I_C



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